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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,862	09/22/2003	Christof Mehler	PF0000053935	4311

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EXAMINER	
CREPEAU, JONATHAN	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
12/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/664,862	MEHLER ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 7-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-4 and 7-9. The claims remain rejected for substantially the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 103

2. Claims 1-4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1011164 in view of Thielen et al (U.S. Patent 6,331,586).

EP '164 is directed to a PEM fuel cell comprising a separator plate comprising a polymer binder, a powdery carbon filler, and a short fiber (see abstract). The polymer may comprise a variety of materials including polyamide, polyethersulfone, or polyether ketone (see [0018]). The short fiber may comprise carbon fiber and carbon filler may comprise carbon black.

EP '164 does not expressly teach that the binder comprises a polymer blend which includes at least two mutually nonmiscible blend polymers in a co-continuous or intercalated structure, as recited in claim 1.

Thielen et al. is directed to conductive polymer blend having a co-continuous structure (see abstract). The conductive material (e.g., including carbon black and carbon fiber) is substantially localized in one of the polymers (see col. 4, line 15). The blend polymers may comprise a variety of polymers including polyamides and polyethers (col. 6, line 21).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the co-continuous polymer blend of Thielen et al. in the separator plate of EP '164. In column 3, line 24, Thielen et al. state that an object of the invention is "to provide a conductive polymer blend which is suitable for processing by any method, including blow molding," and further state that the polymer blends have "improved mechanical properties." In column 11, line 30, it is taught that "[a] wide variety of articles may be produced from the polymer blends of the invention" including "components for electronic equipment." Accordingly, the skilled artisan would be sufficiently motivated to incorporate the polymer blend of Thielen et al. into the separator plate of EP '164.

Regarding the composition of the plate recited in instant claim 1, it would be obvious to use at least one polyamide and at least one polyether ketone or polyether sulfone as the blend polymers of Thielen et al. As noted above, EP '164 expressly discloses each of these materials, and Thielen et al. teach polyamides as well as polyethers in general. Further, Thielen et al. teach at column 6, line 45, "[i]n general, any pair of polymers may be selected for a blend provided that the two polymers present at least some degree of immiscibility and preferably differ in their polarity." Accordingly, the artisan would be sufficiently skilled to use the claimed polymers in the blend of EP '164.

Regarding the weight ratios recited in claims 3, 4, and 7, it would be well within the skill of the art to vary the specific amounts of carbon black, carbon fiber, and blend polymer(s) to affect the characteristics of the separator plate. It has been held that the discovery of an optimum

value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). In this case, the artisan would be able to optimize the conductivity of the plate in light of its mechanical integrity. Thus, it would be obvious to manipulate the amounts of fillers and polymers to amounts encompassed by the claimed ranges.

Response to Arguments

3. Applicant's arguments filed October 18, 2007 have been fully considered but they are not persuasive. It is acknowledged that between the references, there are numerous materials disclosed as being useful in the respective inventions. However, the position is maintained that the disclosure in EP '164 (Saito et al.) of polyamide, polyethersulfone, and polyether ketone, and the disclosure in Thielen et al. of polyamides and polyethers (as well as polysulfones and "polymers containing ketone group(s)," see col. 6, lines 24 and 29) fairly suggests the claimed combination of a polyamide and a polyether ketone or a polyether sulfone. First, as noted by Applicants, Thielen et al. teach that any pair of polymers may be used in the blend provided they meet certain criteria (col. 6, line 45 of Thielen et al.). Although the particular species of polyether, polysulfone, and/or ketone-containing polymer recited in claim 1 are not expressly disclosed by Thielen et al., the skilled artisan may look to Saito et al. for these species. It has been held that choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success, is generally within the skill of the art. See *KSR v. Teleflex*, 82 USPQ2d 1385, 127 S. Ct. 1727 (2007). Additionally, the court in *KSR* held that a claim would

have been obvious because "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If the leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." Thus, the claimed polymer blends are believed to be obvious over Saito et al. and Thielen et al.

As a way of obviating the rejection, evidence of secondary considerations such as unexpected results would be viewed favorably. Applicants state in the remarks that the use of the claimed polymers makes it possible for the bipolar plate to be used under higher temperatures than plates made of, for example, a blend of polyethylene and polystyrene. Applicants further state that higher temperature increases the reaction rate in the fuel cell, and that this result is unexpected. First, it is noted that Applicant's statements are not substantiated by any evidence, and arguments of counsel cannot take the place of factually supported objective evidence (MPEP 2145). Additionally, it is submitted that the above-noted result cannot be characterized as unexpected because it is well-known that higher operating temperatures increase reaction rate and fuel cell efficiency. Furthermore, the selection of blend polymers that are able to withstand a particular fuel cell operating temperature also would be well within the skill of the art. Applicant's example of a blend polymer comprising polyethylene and polystyrene is also not believed to be the most relevant comparison to the claimed polymers. This combination is not expressly disclosed in Thielen et al., and as stated by Applicants, the melting point of this blend is too low to allow for optimal fuel cell operation. Comparison of the claimed blends to other blends, such as the exemplary embodiments of Thielen et al., is suggested.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J.Y

Jonathan Crepeau
Primary Examiner
Art Unit 1795
December 21, 2007